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How China Has Changed Rules For Students Going Abroad

First of a series of occasional articles exclusively for SGR by Wang Zhen, a former Fulbright scholar who returned this year to the Chinese newspaper Science & Technology Daily, *where she is a staff reporter.*

Beijing. There has been a good deal of confusion lately about new government-mandated restrictions on Chinese students at universities in the US. Last spring, the electronic message circuits between the US and China were humming as students sought clarifications. And many who were already abroad, as well as those hoping to go, sent a petition of protest to the then-Acting Premier Li Peng.

The situation is best understood by first recognizing that the approximately 50,000 Chinese students abroad (30,000 of them at some 1000 universities in the US) fall into three basic categories:

• Government-funded students, a relatively small group of about 3000 young people who are annually selected and supported by the national government to study for higher academic degrees. About 600 a year go to the US, with the balance going to various other nations.

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• So-called workunit-sent students, totaling about 4000 a year, who are sent by business firms, government agencies, local institutions, and so forth, that provide them with fellowships, scholarships, and other types of financial assistance.

• Self-supporting students, about 3000 a year, who are supported by relatives and friends.

According to the official in charge of students studying abroad, Commissioner Huang Xinbai of the State Education Commission, the number of government-funded students going abroad has remained at about 3000 a year since 1980, and will not be changed this year. In recent years, there has been a steady increase in the workunit students going abroad, which reached 5000 in 1987 and stands at about the same this year. It's estimated that about 3000 self-supporting students are going abroad annually, but the figure is uncertain since only the government-funded and workunit students are administered by the Education Commission.

The changes that are coming reflect a tightening of policy on types and duration of studies, rather than on numbers, at least so far. Applied science is to receive a

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US Aid for Technology Urged By Engineering Academy Head

For US science and technology policy, it was a landmark speech that unfortunately was obscured by the Olympics and the presidential campaign. But take note, because there was Robert M. White, President of the National Academy of Engineering (NAE)—a conservative, industry-dominated, unimaginative bastion of slow motion—lamenting the dominance of the Pentagon in high-tech affairs, and urging new federal policies and spending for promotion of industrial technology.

"We cannot be satisfied with the Defense Department acting as the principal government agency concerned with the nation's technology base," White told the annual meeting of the NAE on September 28. He did not explain the sudden dissatisfaction with a situa-

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In Brief

Science and Politics: Three six-year presidential nominations to the 24-member National Science Board, policymaking body of NSF, are stalled in the Senate Labor and Human Resources Committee (Edward M. Kennedy, Chairman), pending the outcome of the presidential election. On ice since July is the nomination of Allan P. Bromley, Yale physics professor; since August, Arden L. Bement, Vice President, TRW, Inc., and since last week, Miguel Rios Jr., President of Orion International, NM.

In one of its last appropriations measures this year, Congress gave the Defense Department $10 million for National Defense Science and Engineering Graduate Fellowships, with a recommendation that the Pentagon "closely coordinate" the awards with the National Science Foundation's fellowship activities.

The pursuit of federal money for universities continues to be a boom business for Washington lobbyists. The biggest of all in the academic line, Cassidy and Associates, has doubled its roster of university clients to 40 in the last three years. Membership discussions are in advanced stages with three big members of the Association of American Universities, which has cast itself as the arch enemy of lobbied money.

David T. Kingsbury, NSF Assistant Director for Biological, Behavioral and Social Science since 1984, has resigned, effective October 15, for a professorship at The George Washington University. Last year, Kingsbury was investigated for alleged conflict of interest between his federal duties and associations with several biotechnology firms. He denied wrongdoing. Meanwhile, the charges remain under investigation.

. . . Government Fears Loss of Young Talent and Values

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higher priority. The government will no longer send students abroad for undergraduate studies, and it will reduce the number of candidates for the master's degree. At the same time, it will increase the number of visiting scholars and students sent for in-service training, including those who already hold PhDs. But the periods of study will be restricted to from three months to one year. Meanwhile, the workunits will no longer be permitted to send students abroad for academic-degree programs. And the new policy calls for reducing the proportion of students sent to the US.

The time limits for studies abroad have been set as follows: Five years for undergraduate-degree holders to study for the PhD, with the possibility of a one-year extension; two years for the master's degree; four years for master's-degree holders to obtain the PhD, and one and a half years for post-doctoral work. Still in place is an old rule that requires first-degree university graduates to work five years before being allowed to undertake studies abroad; master's-degree holders are required to work two years. Added to these rules is a new one, prohibiting current students in Chinese universities from going abroad to continue their schooling.

Quest for Foreign Support Barred

Another new restriction bars university staff and graduate students from contacting foreign universities or foundations for scholarships, fellowships, or other assistance without first obtaining official permission. Restrictions have also been placed on the dispatch of transcripts and letters of recommendation by the workunits.

Under current policy, more attention is being paid to a regulation adopted in June 1987, which requires government-funded and workunit students to sign contracts specifying how much they will pay back to their sponsors if they don't return home on schedule.

The policy shifts can be attributed to government fears of losing a grip on young people, especially expensively trained young people whose skills are needed at home. The anxieties are also rooted in traditional reverence for the Chinese social system and culture. The government wants the students to learn advanced Western science and technology without being influenced by Western ideology and values. But most of the self-supporting students don't want to return, while a growing number of government-funded and workunit students tend to remain in the US.

According to a survey of 5300 master's-degree candidates in the Chinese Academy of Sciences, 65 percent have contacted foreign universities for advanced studies. In many institutes of the Academy, young researchers are preoccupied with going abroad. Graduate students shop around for workunits that might sponsor foreign studies. Others seek the assistance of relatives in the West. A "brain drain" is frequently cited as a growing national problem, and it is often claimed that young scientists are in short supply in China because so many are abroad.

Trying to Bring Them Back

Poor housing and social amenities, along with limited amounts of advanced scientific equipment, are generally regarded as the motive for going abroad and staying there. In response, the authorities have been attempting to assure students already abroad that things back home aren't as bad as they may think. Last summer, for example, in a new approach to the problem, the State Education Commission brought 20 students home for a visit to discuss the changes that have been taking place in China and the living and working opportunities that await returning scientists.

Among some scientific leaders here, eagerness to go abroad and reluctance to return are not viewed as a calamity that calls for drastic measures. Qian Xuesen, the President of the China Science and Technology Association, returned to China in the 1950s after studying in the US. He says, "We shouldn't criticize those choosing not to come back on schedule. Even if they return right away, they cannot be given full play because our institutions and enterprises are not completely reformed and activated. With the assistance of foreign friends, they are able to continue their research work. After the year 1990, when there are great changes at home, they will choose to return to China, just as I did in the 1950s."

That longterm, relaxed assessment may turn out to be correct. But in the meantime, tighter regulations are being imposed on the conditions for studying abroad, particularly in the US.

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AAAS Executive Officer Quits for Top Oak Ridge Post

Creating surprise and some annoyance, Alvin W. Trivelpiece has announced that after a mere 20 months as Executive Officer of the American Association for the Advancement of Science (AAAS), he'll leave around January 1 to become Director of the Oak Ridge (Tenn.) National Laboratory.

The AAAS, whose 132,000 members make it the nation's largest general scientific society, has long been drifting uncertainly. When Trivelpiece was appointed as top hired hand last year, there were hopes that he'd dig in, lead, and endure like his immediate three predecessors, who served 14, 5, and 12 years respectively. His tenure was not marked by any major innovations.

In terms of power and prestige, the AAAS is no match for Oak Ridge, a $500-million-a year enterprise with a staff of 5000. Along with the Oak Ridge job comes a vice presidency in Martin Marietta Energy Systems, the Martin Marietta subsidiary which manages the laboratory for the Department of Energy. Trivelpiece came to the AAAS from DOE, where he was Director of the Office of Energy Research from 1981-7. He is credited with shepherding the super collider to presidential approval.

He told SGR that he's making the move because he'd like to get back to science and technology, and also because he's concerned about another energy crisis over the horizon. At Oak Ridge, he'll succeed Herman Postma, who, in a classic "revolving door" movement, left Oak Ridge last February to become Senior Vice President of Martin Marietta Energy Systems.

While a search committee, drawn from the AAAS Board, looks for a successor, the post of Executive Officer will be filled on an acting basis by Philip H. Abelson, editor of the AAAS weekly *Science* from 1962 to 1984. He has since remained on as a Deputy Editor of the weekly.

Trivelpiece's abrupt departure upsets the languid managerial rhythms of the AAAS, an organization in search of a role beyond its sponsorship of *Science*. The magazine is the magnet for membership and, with its advertising, the main source of AAAS revenue—which totaled $33.8 million last year. In recent years, however, especially under the editorship of Daniel E. Koshland, Jr., *Science* has been seriously challenged by its British counterpart *Nature* as a place of primary publication for important scientific papers and in coverage of science-policy news around the world.

Abelson guided *Science* into the modern era during his long reign, but ran out of steam in the final years. The AAAS Board, ignoring the advice of its own search committee, then brought in Koshland from UC Berkeley, but on his own condition of a half-time appointment, with the expectation that he'd restore vigor and

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. . . *Pentagon Is US Counterpart to Japan's Technology Agency*

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tion that the NAE leadership has tolerated for years while outsiders were raising the same concerns that White was now trumpeting. But, whatever the source of that omission, he did go on to issue the following warning:

"We neglect support for engineering and technology at our peril. We have a science policy, but no technology policy. And while the debates in this city center largely on priorities for scientific activities, these debates, however important, are only loosely coupled to the fundamental issue that our country faces. As a new period of opportunity is presented with the election of a new President, we must come to grips with the need for a technology policy."

White told his members: "I find it interesting that the recent budget proposals of the Japanese Ministry of International Trade and Industry targeted such fields as artificial intelligence, superconductivity, and hypersonic planes, among others, for concerted action. And where are the analogous initiatives in the US government? Largely in the DOD."

Efforts, of course, have been made in the past to place them elsewhere, or at least to nudge the National Science Foundation toward a bigger role in engineering. But these have drawn opposition or at most lukewarm support from the establishment, including the Academy of Engineering. Even so minor a symbolic matter as retitling NSF the National Foundation for Science and Technology has been repeatedly beaten down as a threat to basic research in universities.

White's candidate for assisting American industry is the former National Bureau of Standards, newly renamed by Congress as the National Institute of Standards and Technology, which remains in the Department of Commerce. "We have an opportunity to build on this new Institute," he said, cautioning, however, that the renaming, with some new authority included, is only a first step. "It must be accompanied by further action to strength the Department of Commerce . . . " White also called for more money and authority for the White House Office of Science and Technology Policy, which he said should "provide a broad policy overview of all science and technology activities."

Congratulations to NASA; Now Ground the Space Shuttle

Now that the space shuttle has redeemed NASA's technological honor, good sense calls for consigning the fleet to museum status and getting on with a workable space program.

The essence of such a program would be simple, reliable launchers, unencumbered by the most useless cargo ever sent into orbit—fragile astronauts. The folly of a space program fixated on humans is apparent, but that doesn't bother NASA, or many of its aerospace industry allies, or the simpleminded space romantics who derive vicarious kicks from man in space.

The NASA propaganda mill, abetted by an uncritical press, portrays the revival of the shuttle as a triumph and harbinger of a great era in space. But in reality, the shuttle was from the very start a cumbersome and awkward craft designed as much for public relations as for working in space. Looking for an extravaganza as a follow-on to the moon landing, the space establishment adopted the shuttle as a high-visibility venture that would grip public attention.

NASA thus offered the glamor of man in space, but without inviting much notice to the fact that the shuttle takes off and lands automatically. Furthermore, most if not all the chores assigned to the crew could be performed robotically—if funds were devoted to developing robots. To create an aura of necessity for the shuttle, NASA planned development of a manned, but purposeless, space station for which the shuttle would haul construction materials. The White House and Congress then contributed to the inevitable debacle by telling the space agency to proceed, but on a shoestring.

A promise of frequent, relatively inexpensive flights by the shuttle—50 a year, Congress was initially told—never came even close to fulfillment. When the ill-fated *Challenger* went aloft, NASA was straining to manage a dozen flights a year. In just a few years, the shuttle had rapidly and ungracefully aged into creaky obsolescence, suffering from old computers and other antiquated equipment ripe for the Smithsonian.

Before the 32-month hiatus in flights that followed the *Challenger* explosion, NASA had reduced the "turnaround," or preparation time, for a shuttle flight to 55 workdays, according to a new report by the Congressional Office of Technology Assessment (*Reducing Launch Operations Costs*—see In Print, P. 8). But because of safety changes and intensified concern about risks, the turnaround time has now increased to 150 days, OTA reports. Before the

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AAAS

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enterprise to the journal. The results so far have been disappointing.

Whereas *Nature* sparkles with information, analysis, controversy, and bright writing, *Science,* though graphically attractive, is often intellectually drab, and, in its editorial columns, sophomoric. The subscription figures, however, still overwhelmingly favor *Science,* with 160,000 to 35,000 for *Nature*—a difference that may be largely attributable to the cost advantages that *Science* derives from its non-profit status. For $70 a year, *Science* comes with membership in the AAAS, whereas *Nature,* published by the commercial Macmillan Magazines, costs $125 in the US for an individual subscription. The disparity for institutional subscriptions is even greater—$110 for *Science,* $275 for *Nature.*

To the bafflement of the elders and staff of the AAAS, membership remains stuck around 132,000, which is about where it was over a decade ago, while in the same period the number of scientists and engineers in the US has increased by about 75 percent. Attendance has dwindled at the annual AAAS meeting, which was once a major occasion in the professional and social life of the scientific community.

Prior to Trivelpiece's appointment, the AAAS suffered a loss of prestige and confidence when its biggest innovation of recent years, a science magazine for a popular audience, titled *Science 86* in its final year at the AAAS, was sold off to Time, Inc., which folded it into its own sinking pop science magazine, *Discover.* Time later sold *Discover* to another publisher, Family Media, which continues to produce the magazine.

On the positive side, the AAAS has focused public attention on the oppression of foreign scientists and has organized useful discussions of scientific misconduct, as well as annual forums on the federal R&D budget and on arms control. It is also engaged in developing science-education programs, as well as a number of other activities. Virtually all the innovations originated during William Carey's 1975-87 reign as Executive Officer.

At the AAAS, as is generally the case with professional societies, the post of Executive Officer is especially important. The Board of Directors is composed of very busy people chosen for their professional luster rather than their ability to devote the necessary time to the affairs of the organization. The current President is Walter E. Massey, Vice President for Research and the Argonne National Laboratory, University of Chicago, and the President-elect is Richard C. Atkinson, Chancellor of the University of California, San Diego. Massey will chair the search committee for a new Executive Director.—DSG

Overhead: 1989 Rates for the "Top Dollar" Schools

Among the more opaque elements in academic-government relations is the overhead rate—the cut that the university gets for the costs of providing a home for federally financed research. No one understands how overhead rates are computed or why similar institutions have strikingly different rates. Nonetheless, they are a fact of research economics, and an offense to many researchers, who rightly note that overhead money comes out of research appropriations. The rates are computed by government auditors who periodically set the figure for each institution. SGR presents the 1989 rates for the so-called top-dollar schools, which receive about 90 percent of federal science funding for academe, along with the '86 rates for comparison. The 1989 figures are, in many instances, subject to adjustments, but that rarely brings big changes. (SGR last presented the rates in the issues of December 1 and 15, 1985).

	1986	1989
Albany Med. Coll	76.0	65.0
Arizona State U	47.0	49.0
Baylor Coll. of Med	44.5	44.0
Boston U	81.8	73.0
Bowman Gray Schl. Med.	40.5	38.5
Brandeis U	58.0	60.0
Cal Inst. of Tech	53.0	58.0
Carnegie-Mellon U	55.0	55.0
Case Western Reserve	50.0	50.0
Colorado State U	39.9	39.9
Columbia Univ.	74.1	74.1
Cornell Univ.	63.6	66.0
Dartmouth College	51.0	50.0
Dayton, Univ. of	62.9	57.0
Duke U	50.0	50.0
Emory U	51.5	52.0
Florida State U	44.2	44.0
George Washington U	56.0	48.0
Georgetown U	59.0	59.0
Georgia Inst. of Tech.	52.8	52.8
Harvard Med. School	99.0	77.0
Harvard U	66.0	68.0
Hawaii, Univ. of	43.0	44.0
Howard U	95.0	78.0
Illinois, U (Chicago)	57.0	57.0
Illinois, U (Urbana)	48.4	50.3
Indiana U	46.0	47.5
Iowa State	34.0	38.0
Johns Hopkins	61.0	61.0
Lehigh U	65.0	62.0
La. State U Med. Ctr	38.0	39.0
Louisiana State U	43.0	45.0
MIT	51.0	53.0
Michigan State U	41.0	44.0
Mt. Sinai Med. School	65.0	60.0
New Mex. State U	51.5	48.8
NYU	50.1	51.0
NYU. Medical Center	71.5	63.5
NC State, Raleigh	42.0	46.0
Northwestern U.	44.0	51.0
Ohio State U	45.0	43.0
Oklahoma State U	39.0	42.0
Oregon State U	34.0	36.0
Penn State U	46.0	33.7
(Hershey Med. Cent)	54.0	25.0
Purdue U	46.0	46.0
RPI	68.0	59.4

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Shuttle *(Continued from page 4)*

crash, NASA described the shuttle as "operational," rather than experimental, though those astonishingly lengthy turnaround times would bankrupt any commercial operation.

In aviation, reliability grows as aircraft evolve from the experimental to the operational stage. But the surviving three shuttle orbiters, as well as the *Challenger* replacement under construction, are essentially handmade craft that will never achieve routine operations. The OTA study notes that "each of the solid rocket boosters, one of the simpler shuttle elements, contains about 75,000 parts and components. Of these, about 5000 are removed, inspected, and replaced or refurbished after each shuttle flight." OTA adds that the shuttle has "about 250,000 electrical connections which must be tested for continuity. Each time one of the 8000 connectors is disconnected or removed, there is a chance that one or more pins will be damaged or will otherwise fail to reconnect properly."

At present, there's not enough launch capacity to take the place of the shuttle—the reason being that cost overruns on the shuttle consumed funds for alternative means of getting into space. But with all due speed, the big white elephants should be put to pasture in favor of less costly but more reliable basic launch vehicles. As in pre-shuttle days, these can attend to NASA's showbiz requirements by lofting men into space.

Retirement of the shuttle should not be mistaken as wastefulness. NASA and its political chiefs must learn the basic lesson of economics that catches up with every car owner. At some point, it's cheaper to trade it in than to keep on fixing it up.—DSG

Overhead *(Continued)*

Rhode Island U	50.0	43.0
Rice U	39.0	42.5
Rochester, Univ. of	56.0	59.0
Rockefeller U	65.0	68.0
Rutgers U	65.0	64.0
St. Louis U	40.0	43.0
S Carolina, Med U.of	49.0	38.5
Stanford U	69.0	73.0
SUNY, Albany	50.4	52.1
SUNY, Buffalo	50.6	52.7
SUNY, Stony Brook	50.5	52.4
SUNY, Downstate Med	54.2	56.9
Temple U	62.0	62.0
Texas A&M	38.0	38.5
Texas Tech U	39.0	41.0
Thomas Jefferson U.	65.0	61.0
Tufts U	75.0	70.0
Tulane U Med. School	49.0	50.0
U of Ala., Birmingham	40.0	42.0
U of Arizona	44.0	47.0
UC Berkeley	45.6	47.0
UC Davis	39.0	39.2
UC Irvine	43.0	45.5
UCLA	46.0	46.0
UC Riverside	40.5	41.0
UC San Diego	43.0	46.0
UC San Francisco	32.6	36.5
UC Santa Barbara	45.0	45.0
U Chicago	69.0	62.0
U Cincinnati	49.0	53.0
U Colorado	41.5	4.25
U Colorado HSC	36.0	41.2
U Connecticut	56.0	56.0
U Connecticut HSC	55.6	54.0
U Delaware	65.0	56.0
U Florida	42.0	45.0
U Georgia	43.5	45.6
U Houston	44.0	46.0
U Iowa	40.0	39.0
U of Kansas	43.0	44.0
U Kansas Med. Center	40.0	41.0
U Kentucky	50.0	49.0
U Md., Baltimore	41.0	49.0
U Md., College Park	39.0	46.0
U Mass., Amherst	50.0	50.0
U Mass Medical School	67.0	62.0
U Medicine, Dent. NJ	73.0	65.5
U Miami Med School	57.0	57.0
U Michigan	50.0	59.0
U Minnesota	41.0	43.0
U Mississippi	34.2	4.0
U Missouri, Columbia	37.5	37.5
U New Hampshire	46.1	58.0
U New Mexico Medical	46.0	48.0
U NC, Chapel Hill	43.5	44.5
U North Dakota	35.0	39.5
U Oklahoma	43.0	43.0
U Oregon	41.0	42.0
U Oregon, HSC	42.5	43.0
U Pennsylvania	65.0	64.0
U Pittsburgh	43.0	43.0
U South Carolina	50.0	49.0
U Southern Cal	66.0	65.0
U Tenn., Knoxville	42.0	38.5
U Tenn. HSC	42.0	44.0
U Texas, Austin	44.0	46.0
U Texas Cancer Center	43.0	45.0
U Texas HSC, Dallas	42.0	45.0
U Texas HSC, Houston	45.0	47.0
U Texas HSC, San Ant	42.0	45.0
U Texas Med Galveston	42.0	44.0
U Utah	45.5	47.0
U Vermont & State Ag	50.3	55.0
U Virginia	52.0	49.0
U Washington	43.0	48.0
U Wisconsin, Madison	43.0	44.0
Wisc., Medical Coll	58.1	56.1
Woods Hole Ocean Inst.	2.6	57.8
U Wyoming	39.0	39.0
Utah State U	35.0	37.0
Vanderbilt U	54.4	54.4
Va. Commonwealth U	50.0	50.0
Va. Poly and State U	50.0	49.0
Washington State	43.5	43.5
Washington U	51.0	59.0
Wayne State U.	47.0	47.0
Yale U.	72.0	68.0
Yeshiva U.	87.5	70.0

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Study Set on VA Physicians

At the request of the Veterans Administration, the Institute of Medicine is undertaking a two-year study of longterm physician requirements for the VA healthcare system. The study is chaired by David R. Challoner, Vice President for Health Affairs, University of Florida. Itzhak Jocoby is serving as staff study director.

In Quotes: Japan's "Old-Boy Network" Boosts Industry

From "A Survey of High-Technology Transfer Practices," by Robert A. Cutler, National Science Foundation senior staff associate who was a Fulbright Research Fellow at the University of Tokyo last year. Cutler's article appears in the latest issue (April-June 1988) of Scientific Information Bulletin, *a quarterly jointly published by the Tokyo-based research offices of the US Navy, Army, and Air Force.*

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Japanese industry has two powerful assets: a cohesive national policy on technology development and a scientific "old-boy network," with links to practically every board room and laboratory in the country. The Government spends nearly one-third of its R&D budget (20 percent of total R&D spending) at universities and at Government research institutes, and nearly all of this activity is centrally coordinated through Government committees and the scientific old-boy network.

Here is how the two circles of power work. Perhaps you noticed that Japanese companies seem to sell similar products. So much so that it looks like they must be collaborating on the designs and specs. That is because "high-tech" Japan is a small country and the top engineers in the companies know each other. For that matter, so do the company presidents, who most likely went to the same university at the same time. When one company starts something new, the president calls his friends to discuss it.

Scientific Information Bulletin ***(NAVSO-P-3580), published quarterly, is focused on R&D developments in Asia, with the emphasis on Japan. It is written by scientific and technical specialists of the three US military services, with occasional contributions from outside authors. Annual subscriptions are $13 in the US; $16.25 abroad. Order from: USGPO, Superintendent of Documents, Washington, DC 20402; tel. 202/783-3238***

Japanese companies do not suffer from the "not-invented-here" syndrome, that attitude which stifles ideas from external sources. Instead, they are eager to please their customers and would rather have their people involved in making something better for the marketplace than trying to capture all of the profits from a new technology product. In fact, the licensing of patents from other companies and from foreign sources is widely practiced.

Many foreigners imagine that Government officials at the Ministry of International Trade and Industry (MITI) stand over the R&D stage like grand puppeteers, manipulating private industry at will. This is not the case, particularly because the average MITI officer changes jobs every two years.

MITI's method of influence is through its "committees." Mixtures of industry leaders, academics, and consumers (users) are selected for dozens of committees on new technology and industry matters, ranging from restructuring a weak industrial sector to organizing a national program for advanced robotics or for manned spaceflight.

Through committee debate, MITI helps industry form a consensus on which areas of new technology it should concentrate. By this "committee method" policy is actually negotiated by the leaders of industry, so it is accepted naturally by all the companies. That is what I found to be the secret of Japan's cohesive industrial policy: the Government acts as the organizer and coordinator of private industry action. Eighty percent of the R&D funding in Japan comes from private industry rather than from the Government . . . .

In the United States, the antitrust laws have required each competing firm to carry on its own industrial research. Technical cooperation not only is limited but is often perceived as unlawful by corporate management. Recently, however, the laws have been liberalized to allow certain consortia like MCC, SEMATECH, and the Semiconductor Research Corporation to be organized.

Things are different for industrial research in Japan. The Government there actively promotes the formation of research associations among leading companies in particular fields for purposes of developing and transferring new technologies. Patents resulting from these arrangements are pooled for participating companies to use. And there is a remarkably high degree of communication and collaboration between professors at leading Japanese universities and their colleagues who work in competitive companies.

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Reporting of Social Science in the National Media (Russell Sage Foundation, 296 pp., $29.95) by Carol H. Weiss, Professor, Harvard Graduate School of Education, and Eleanor Singer, Senior Researcher, Columbia Center for Social Sciences, reviews social-science coverage by the major newsweeklies, TV networks, and several big dailies, and, not surprisingly, finds it often spotty, thin, inaccurate, and lacking perspective (the common sins of the news media on all subjects but major sports and business). A serious defect is that the study ends with 1982, and thus does not extend to the outstanding social-science reporting and analysis that Daniel Coleman has brought to the *New York Times*—which, in turn, has prodded several other news organizations to upgrade their coverage.

Order from: Russell Sage Foundation, 112 E. 64th St., New York, N.Y. 10021; tel. 212/750-6000.

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Scientific and Engineering Research Facilities at Universities and Colleges (NSF 88-320, 45 pp. plus extensive appendices, no charge), second of a biennial study requested by Congress, conducted for NSF by Westat, Inc., consultants, reports a building spree in university research departments, with planned total floor space annually growing by 10 percent over 1986-89, for a total of $5.5 billion in construction. More than half the institutions reported their facilities were adequate. But many others reported serious deficiencies. Federal agencies provided only six to seven percent of the construction funds, with the bulk coming from state and local governments, private and institutional sources, and tax-exempt bonds. (Congress this year authorized NSF to resume university construction funding—but provided no money for that purpose.)

Order from: NSF, Division of Science Resources Studies, 1800 G St. NW, Room L-602, Washington, DC 20550; tel. 202/634-4664.

From the Congressional Office of Technology Assessment (OTA):

Pesticide Residues in Food: Technologies for Detection (GPO Stock No. 052-003-01132-8; 232 pp., $10), says public concern about pesticides in food is not matched by action or interest in federal agencies responsible for food safety. OTA states that analytical techniques and monitoring programs have not kept pace with the volume of pesticides and the introduction of new products, and recommends more research, expanded monitoring and inter-agency coordination by the Food and Drug Administration, the Environmental Protection Agency, and the Department of Agriculture.

Institutional Protocols for Decisions About Life-Sustaining Treatments (GPO Stock No. 052-003-01123-9; 83 pp., $3.75), states that in 1986, 43 percent of hospitals and 80 percent of nursing homes lacked formal do-not-resuscitate (DNR) policies, and, in their absence, employed case-by-case ad hoc procedures. The report discusses legal and ethical aspects of DNR policies, and includes sample regulations from several hospitals. The study is a followup to a big OTA report last year on ***Life Sustaining Technologies and the Elderly*** (GPO Stock No. 052-003-01074-7; 459 pp., $19).

Reducing Launch Operations Costs: New Technologies and Practices (GPO Stock No. 052-003-01118-2; 94 pp., $4.50), says there's a big cost-saving potential for space operations in more efficient pre-launch activities (such as assembly and testing of vehicles and payloads), "Yet these relatively mundane processes and procedures seldom receive close scrutiny from the Congress, or attention from the policy community." But OTA also says that cost reductions would entail major spending on new equipment, and that without a large volume of space traffic, net costs might actually rise.

Order OTA publications from: USGPO, Superintendent of Documents, Washington, DC 20402; tel. 202/783-3238.

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